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United States Patent [19]**Guritz**[11] **Patent Number:** **5,575,554**[45] **Date of Patent:** **Nov. 19, 1996**[54] **MULTIPURPOSE OPTICAL DISPLAY FOR ARTICULATING SURFACES**[76] **Inventor:** **Steven P. W. Guritz**, P.O. Box 10022,
Portland, Oreg. 97120[21] **Appl. No.:** **354,558**[22] **Filed:** **Dec. 13, 1994****Related U.S. Application Data**

[60] Division of Ser. No. 890,706, May 29, 1992, Pat. No. 5,375,044, which is a continuation-in-part of Ser. No. 698,824, May 13, 1991, Pat. No. 5,128,843.

[51] **Int. Cl.⁶** **F21L 15/08**[52] **U.S. Cl.** **362/103; 362/806**[58] **Field of Search** 362/103, 108,
362/800, 806, 234[56] **References Cited****U.S. PATENT DOCUMENTS**

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Primary Examiner—Stephen F. Husar*Attorney, Agent, or Firm*—Milton S. Gerstein[57] **ABSTRACT**

An optical display device for use with wearing apparel or in combination with novelty gifts for illumination thereof. The optical display device based upon a control circuit capable of energizing incandescent lamps attached to a conductive pathway. The control circuit having an IC based timing circuit with manual switches for lamp lighting mode sequence as well as sequencing speed. An alternative embodiment is disclosed using an EPROM IC chip wherein all sequencing and functional timing is performed by an instructional software program made operational upon manual switch toggling. The conductive pathway provides electrical coupling to the lamps with one embodiment having a pathway formed from flexible circuit boards. Use of flexible circuit boards permits simplistic color changing by use of peel-off covers placed over the lamps as well as protection from moisture, impact, or dislodgement of the lamps. The coupling of circuit boards across movable joints is by flexible wire or conductor tape. Placement of the flexible circuit boards on the active limbs of a body in motion enhances the optical display thereby illuminating the wearer for ornamental or safety purposes. Alternative to the circuit board is the use of a conductive ink, preferably silver, which is directly impregnated onto the object. Conductive ink is especially suitable for wearing apparel such as t-shirts wherein a silk screen is used for background and the lamps highlight the design.

9 Claims, 15 Drawing Sheets